

## Original Research


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**Abbreviations:** HESPER, Humanitarian Emergency Settings Perceived Needs; GLIDE, Global Identifier numbers

**Corresponding author:** Karin Hugelius,  
Email: [karin.hugelius@oru.se](mailto:karin.hugelius@oru.se).

# Use of the HESPER Web to Assess Perceived Needs Immediately After Multiple Disaster Events in Fiji

Karin Hugelius PhD, MSc, RN, RNA<sup>1</sup> , Maya Semrau PhD, MSc, BSc<sup>2</sup> and Marie Holmefur PhD, Professor, Reg. OT<sup>1</sup>

<sup>1</sup>Faculty of Medicine and Health, Örebro University, Örebro, Sweden and <sup>2</sup>Brighton and Sussex Medical School, Brighton, United Kingdom

## Abstract

**Objective:** In January 2022, Fiji was hit by multiple natural disasters, including a cyclone causing flooding, an underwater volcanic eruption, and a tsunami. This study aimed to investigate perceived needs among the disaster-affected people in Fiji and to evaluate the feasibility of the Humanitarian Emergency Settings Perceived Needs Scale (HESPER Web) during the early stage after multiple natural disasters.

**Methods:** A cross-sectional study using a self-selected, non-representative study sample was conducted. The HESPER Web was used to collect data.

**Results:** In all, 242 people participated. The number of perceived serious needs ranged between 2 and 14 (out of a possible 26), with a mean of 6 (SD = 3). The top 3 most reported needs were access to toilets (60%), care for people in the community who are on their own (55%), and distress (51%). Volunteers reported fewer needs than the general public.

**Conclusions:** The top 3 needs reported were related to water and sanitation and psychosocial needs. Such needs should not be underestimated in the emergency phase after natural disasters and may require more attention from responding actors. The HESPER Web was considered a usable tool for needs assessment in a sudden onset disaster.

The island nation of the Republic of Fiji is a middle-income country comprising about 900 000 people located on more than 350 islands. Due to the volcanic islands, the country is prone to a number of natural hazards, including earthquakes, landslides, cyclones, flooding, and storm surges.<sup>1</sup> During a period of a few weeks in January 2022, Fiji was hit by multiple natural disasters: Cyclone Cody (GLIDE ID number TC-2022-000007-FJI) that caused storms and severe flooding, and an underwater volcanic eruption and tsunami (epicenter at Tonga, GLIDE ID number VO-2022-000005-FJI), forcing thousands of people to evacuate their homes.

Needs assessment is one of the foundations in humanitarian response following a natural disaster and is crucial to making sound decisions on the kind of response that is needed and when it should be delivered.<sup>2</sup> However, multisectoral needs assessments to generate reliable data are seldom conducted.<sup>2</sup> Often, needs estimations are based on secondary data rather than an inventory of needs from the affected population's perspective.<sup>3</sup> Such inventories are especially limited during the early period after a natural disaster. Conducting needs assessments during the early stage of a natural disaster comes with several practical challenges, including physical access to the affected population due to damaged infrastructure, security threats, or disrupted communications. The first response to most natural disaster is depending on citizens and voluntary responders. At the same time, individuals who respond to disasters are often exposed to both physical and psychological harm.<sup>4</sup> Since the well-being of responding volunteers is essential for a resilient disaster response, knowledge on their perceived needs and well-being is of specific interest to enhance a resilient disaster response.

The Humanitarian Emergency Settings Perceived Needs (HESPER) scale<sup>5</sup> is recommended by the World Health Organization (WHO) and The Humanitarian Programme Cycle for conducting rapid multisectoral needs assessments and reporting the findings.<sup>5</sup> As recommended,<sup>5,6</sup> the scale offers possibilities to analyze the findings gender-wise. Both the original HESPER survey, in which data are collected via face-to-face interviews or surveys, and the online version, called *HESPER Web*, have shown to be valid and reliable tools to assess perceived needs in long-term humanitarian contexts.<sup>6–8</sup> However, the HESPER Web scale has not yet been tested in a sudden onset disaster context. Therefore, this study investigated perceived needs among disaster-affected people in Fiji and evaluated the feasibility of the HESPER Web survey during the early stage after multiple natural disasters.

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**Table 1.** Overview of demographics and total number of needs among the total study sample, general public, and volunteers, and demographics of the overall Fiji population

Demographic	Total (N = 242)	General public (n = 165)	Volunteers (n = 77)	Fiji general population***
Age*	33 (19–67; SD: 11)	32 (19–67; SD: 11)	34 (19–56; SD: 10)	29
Gender**				
Male	110 (46%)	91 (56%)	16 (32%)	(51%)
Female	132 (55%)	73 (44%)	52 (68%)	(49%)
Number of needs*	6 (2–14; SD: 3)	6 (2–14; SD: 3)	5 (2–10; SD: 2)	

Data are presented as \* = mean (range; SD) or \*\* = n (%). The general Fiji population demographic is represented by three asterisks (\*\*\*).<sup>11</sup>

The objectives were to (1) inventory perceived needs among a disaster-affected population in the early state after natural disasters, (2) evaluate the feasibility of HESPER Web in a sudden onset disaster context, (3) analyze any differences in perceived needs between male and female, and (4) analyze perceived needs among volunteers involved in the response, compared to those of the general public.

## Methods

### Study Context

A cross-sectional study was conducted. During a period of a few weeks in late 2021 and early 2022, Fiji was hit by flooding (starting at the end of December and increasing during January), a tropical cyclone (January 9, GLIDE ID TC-2022-000007-FJI), causing strong winds and flash floods, and an underwater volcanic eruption with its epicenter in Tonga (erupting on January 15, GLIDE ID VO-2022-000005-FJI) that led to a tsunami. At the same time, the coronavirus disease (COVID-19) pandemic was ongoing. During this period, about 67 000 people were affected in any of these disaster events, 20 people were reported deceased due to the flooding and cyclone, and over 3000 people were evacuated from their homes to temporary evacuation centers.<sup>9</sup>

### Instrument

The HESPER Web scale is an online survey with 26 items covering both physical and psychosocial needs. All items also provide a brief description of the item, for example: “Distress. Do you have a serious problem because you feel very distressed? For example, very upset, sad, worried, scared, or angry.”<sup>4</sup> Three ratings are available for each of the items: (1) “yes, a serious problem”; (2) “no, no serious problem”; and (3) “don’t know/don’t want to say/not applicable.” The instrument also allows study participants to identify their 3 most prioritized current needs.<sup>4,10</sup> In this study, 3 questions on the feasibility of answering the HESPER Web scale were added to the survey, as well as an open question in which the study participants could add any comments.

### Study Sample and Data Collection Process

A non-representative, self-selected study sample was recruited. Voluntary adults (18 years and older) living in Fiji were invited to participate in the study. An invitation to the study, including a weblink (using the software ORU Survey, a protected survey tool and database for research purposes) to the HESPER Web scale, was distributed via social media sites (eg, Facebook) and other websites targeting the general Fiji population, such as a “buy and sell” page and a public disaster preparedness page. In addition, the Fiji Red Cross was asked to spread the invitation to both the general

population and their own volunteers (listed in the Fiji Red Cross volunteer roster) through their digital channels. The survey was open for 7 days (4 days after Cyclone Cody, 5 days after the underwater volcanic eruption and tsunami, and during the period of ongoing flooding). Data were collected from January 11 to 17, 2022.

### Analysis

The data were imported from the database into SPSS (version 27.0; IBM, Armonk, NY, USA). Data were presented in accordance with recommendations in the HESPER manual, to allow future studies comparing perceived needs between different disaster events. Descriptive and comparative analyses were conducted using a confidence interval of 95% and a significant *P* value of less than or equal to 0.05. A chi-squared test and Fisher’s exact test were used to calculate differences between male and female participants and between the general public and volunteers.

### Ethics

Before answering the survey, all study participants were informed (by text provided in the online survey link) that the survey was answered anonymously, and that no individual emergency response could be provided through the research project. Informed consent was obtained by marking this in the survey, before the study participant got access to the questions. All survey data were stored in a research survey database using specific protection and only accessible to eligible persons. The study was approved by the Fiji Human Health Research and Ethics Committee (FNHRERC number 21/20) as well as the Regional Ethical Board in Uppsala, Sweden (document number 2017/481).

## Results

### Demographics

In all, 242 individuals answered the HESPER Web survey during the 7-day period (Table 1). Of these, 110 (46%) were male, and 132 (55%) were female. Their ages varied from 19 to 67 years (mean: 33 years). Of all study participants, 165 (68%) considered themselves to be among the general public, and 77 (32%) were volunteer workers (such as Red Cross volunteers).

### Reported Needs

The number of serious needs reported varied from 2 to 14, with a mean of 6 reported needs (SD: 3). The top 3 most reported needs were access to toilets (60%) followed by care for people in the community who were on their own (55%) and who were under distress (51%) (Table 2). The needs defined by the study

**Table 2.** Perceived serious needs reported

Need	Reported as a serious need (N = 242)	Male reported as a serious need (n = 110)	Female reported as a serious need (n = 132)	Difference between genders*
	n (%)	n (%)	n (%)	P value
Toilets	146 (60)	67 (61)	79 (60)	0.896
Care for people in the community who are on their own	134 (55)	17 (15)	25 (19)	0.259
Distress	124 (51)	55 (50)	69 (52)	0.412
Keeping clean	122 (50)	56 (51)	66 (50)	0.898
Place to live	82 (34)	36 (33)	46 (35)	0.786
Information	72 (30)	45 (41)	37 (28)	0.432
The way aid is provided	69 (29)	35 (32)	34 (26)	0.304
Clothes, shoes, bedding, or blankets	69 (29)	41 (37)	28 (21)	0.392
Drinking water	62 (26)	49 (45)	13 (10)	0.001
Mental illness in the community	54 (22)	23 (21)	31 (23)	0.887
Support from others	45 (19)	19 (17)	26 (20)	0.387
Care for family members	42 (17)	56 (51)	78 (59)	0.444
Alcohol or drug use in the community	41 (17)	18 (16)	23 (17)	0.538
Income or livelihood	41 (17)	17 (15)	24 (18)	0.475
Physical health	40 (17)	19 (17)	21 (16)	0.502
Health care	39 (16)	20 (18)	19 (14)	0.581
Respect	16 (7)	8 (7)	8 (6)	0.450
Safety	15 (6)	8 (7)	7 (5)	0.386
Food	12 (5)	10 (9)	2 (2)	0.007
Separation from family members	15 (6)	9 (8)	6 (5)	0.184
Being displaced from home	15 (6)	8 (7)	7 (5)	0.356
Safety or protection from violence for women in the community	1 (0)	0	0	NA
Moving between places	0 (0)	0	0	NA
Too much free time	0 (0)	0	0	NA
Law and justice in the community	0 (0)	0	0	NA
Other serious problems	0 (0)	0	0	NA

\*Calculated with either the chi-squared test or Fisher's exact test.

participants as highest prioritized needs were care for people in the community who were on their own ( $n = 78$ , 32%), toilets ( $n = 54$ , 23%), drinking water ( $n = 52$ , 22%), care for people under distress ( $n = 14$ , 12%) and a place to live ( $n = 27$ , 11%).

No significant differences between the means of the total reported needs were observed between male and female participants ( $M_{\text{males}} = 5.9$ ,  $M_{\text{females}} = 5.9$ ,  $P = 0.810$ ). Similarly, no significant differences between male and female participants could be observed for the top 5 reported needs, but significantly more male than female participants reported the need for access to drinking water and food (see Table 2). Additionally, no significant differences in the mean of total needs could be found between younger (ages 18–39) and older (40+) participants ( $M_{\text{younger}} = 5.9$ ,  $M_{\text{older}} = 6.0$ ,  $P = 0.224$ ). However, volunteers reported significantly fewer perceived needs compared to the general public ( $M_{\text{public}} = 6.2$ ,  $M_{\text{volunteers}} = 5.4$ ,  $P = 0.003$ ). Except for the item “place to live,” no significant differences on the kind of perceived needs were detected when comparing the general public and volunteers (Table 3).

#### Feasibility Evaluation of the HESPER Web Scale

A total of 229 (95%) study participants answered positively regarding whether the questions in the HESPER Web scale were easy to understand (13 participants answered “don’t know,” and

no participants answered “no”). To answer the HESPER Web survey, most participants used their own mobile phone ( $n = 201$ , 83%), whereas some used someone else’s phone ( $n = 13$ , 5%) or a computer or tablet ( $n = 15$ , 5%). All study participants could answer the survey in privacy, and no one reported any harm from answering the HESPER Web survey.

#### Discussion

The perceived needs during the early phase after a series of natural disasters were mainly related to water and sanitation, addressing social concerns, and dealing with distress. No significant differences between gender and ages could be detected, but people engaged as volunteers reported fewer needs than the general public.

When comparing top 3 reported needs in 8 different disasters (OCHA [United Nations Office for the Coordination of Humanitarian Affairs] humanitarian emergencies), these varied. However, psychological or social needs, such as distress or care for family members, were more frequently reported than physical needs such as shelter or access to clean water.<sup>12</sup> When comparing the perceived needs reported by in this study with the official reporting of needs during the same period and same disaster events,<sup>13,14</sup> access to water and sanitation was an agreed-upon first

**Table 3.** Perceived serious needs reported among the general public and volunteers

Need	Reported as a serious need (N = 2412)	The general public reported as a serious need (n = 165)	Volunteers reported as a serious need (n = 77)	Difference between the general public and volunteers*
	n (%)	n (%)	n (%)	P value
Toilets	146 (60)	108 (65)	374 (48)	0.022
Care for people in the community who are on their own	134 (55)	88 (53)	46 (60)	0.647
Distress	124 (51)	82 (50)	41 (53)	0.555
Keeping clean	122 (50)	88 (53)	34 (44)	0.233
Place to live	82 (34)	65 (39)	17 (22)	0.021
Information	72 (30)	49 (30)	22 (29)	0.575
The way aid is provided	69 (29)	47 (28)	21 (27)	0.549
Clothes, shoes, bedding, or blankets	69 (29)	46 (29)	22 (21)	0.283
Drinking water	62 (26)	47 (28)	15 (29)	0.264
Mental illness in the community	54 (22)	36 (22)	18 (23)	0.954
Support from others	45 (19)	31 (19)	14 (18)	0.884
Care for family members	42 (17)	26 (16)	16 (21)	0.578
Alcohol or drug use in the community	41 (17)	28 (17)	13 (17)	0.953
Income or livelihood	41 (17)	29 (18)	12 (16)	0.930
Physical health	40 (17)	26 (16)	14 (18)	0.928
Health care	39 (16)	29 (18)	10 (13)	0.881
Respect	16 (7)	11 (6)	5 (6)	0.963
Safety	15 (6)	11 (6)	4 (5)	0.883
Food	12 (5)	11 (6)	1 (0)	0.192
Separation from family members	15 (6)	12 (7)	3 (4)	0.571
Being displaced from home	15 (6)	11 (7)	4 (5)	0.873
Safety or protection from violence for women in the community	1 (0)	1 (0)	0	NA
Moving between places	0 (0)	0	0	NA
Too much free time	0 (0)	0	0	NA
Law and justice in the community	0 (0)	0	0	NA
Other serious problems	0 (0)	0	0	NA

priority. However, neither the need for care for people in the community who were on their own or dealing with distress, which were highly prioritized by the participants in this survey, was mentioned in the official needs assessment or response strategies. Considering that several studies have shown an association between a high number of perceived needs and mental health problems,<sup>15–17</sup> these findings together emphasize the necessity to cover both physical and psychosocial needs during the early stage after natural disasters and suggest that psychosocial needs should not be underestimated.

The finding that volunteers reported fewer needs than the general population is interesting, and there are several potential explanations for this finding. One possible explanation could be that volunteers had a greater understanding of and interest in disaster preparedness and could thereby mitigate some of the impact from the natural disasters. If so, this indicated that general community preparedness activities could be effective to mitigate the impact of disasters and reduce the number of perceived needs. Previous research has suggested that being deployed as a volunteer worker in the aftermath of a natural disaster, in comparison to not being involved in the response, was associated with a greater quality of life and that volunteers may be more resilient to disasters compared to the general public.<sup>18</sup> However, other studies have also showed an increased risk of mental health problems among

voluntary disaster responders compared to professional responders.<sup>19</sup> In this study, neither distress nor other psychosocial needs were reported as more frequent among volunteers compared to the general public. Given the importance of volunteers in disaster response, studies exploring their well-being, perceived needs, and potential protective effects are needed.

Using the HESPER Web survey to assess perceived needs made it possible to access affected populations in remote areas without being physically near them, which was an advantage given the COVID-19 pandemic and damages on the infrastructure. In theory, a digital survey can inventory perceived needs among a large number of people more quickly than face-to-face interviews or similar. However, a major limitation of this needs assessment is the self-selected, non-probability sample. Representative study sampling is a common problem in both humanitarian practice and research.<sup>20</sup> Despite the obvious advantages of a remote, online needs assessments in the immediate aftermath of a natural disaster, making generalizations from a self-selected sample is problematic.<sup>21</sup> Comparing the voluntary, self-selected sample with the demographics of the Fiji population showed minor disparities. The mean age in Fiji was 29 years (compared to 33 years in the study sample), and the proportion of males in the Fiji population is 49% (compared to 46% in the study sample).<sup>11,21</sup> Despite the similarities, a small sample cannot be generalized to an entire

population, and this survey only covered a small proportion of the entire affected population. Another limitation is the lack of baseline data. This is a well-known limitation in many disaster studies. Still, the study offers information on perceived needs among people who consider themselves affected, and relate to their current situation, despite previous health problems. Another obvious obstacle to using online needs assessment tools is limited access to the Internet. However, today, many people have access to the Internet and smartphones even during ongoing disasters or emergencies. If the weblink to the survey is promoted more broadly and on the day the disaster occurs, it might be possible to get a greater number of people to report their needs and the possibility to assess and respond to the needs of the population more accurately.

This needs assessment inventory was conducted partly in collaboration with a local humanitarian stakeholder. An attempt was made to evaluate the possible advantages and disadvantages of using the HESPER Web tool to assess needs from the perspective of humanitarian actors, but due to the strained situation (including the COVID-19 pandemic), those initiatives were canceled. However, this would be an important perspective to further investigate to gain a full picture of this issue.

## Conclusion

The top 3 needs reported among disaster-affected people after multiple natural disaster events were related to water and sanitation, addressing social concerns, and dealing with distress. Volunteers experience fewer needs than the general public. The results emphasize that psychosocial needs should not be underestimated in the emergency phase after natural disasters and may require increased attention from responding actors.

Despite the limited generalizability of the results due to the non-representative sample, the HESPER Web can be considered a usable tool for needs assessment in a sudden onset disaster.

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**Conflict(s) of interest.** The authors have no financial or personal relationships with other people or organizations that could inappropriately influence or bias their work. There were no commercial associations that could pose a conflict of interest or financial bias.

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